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Summary report of research completed or in progress July 1959 through June 1960, classified under three areas: Identification of talent; vocational goals—their origins and development in he high school and college years; and methodological and descriptive studies. Also lists studies completed January 1957 through June 1960.

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IV #21

Technical Report No. 4

A Program of Research on the Identification, Motivation and Training of Talented Students

Research and Studies
National Merit Scholarship Corporation

IV-19

The aims, methods, and preliminary results of research being conducted under the auspices of the National Merit Scholarship Corporation and financed by the National Science Foundation, the Old Dominion Foundation, and NMSC, have been summarized in earlier technical reports (40, 41, 42). The present report outlines research activities for the twelve-month period, July, 1959 through June, 1960.

In previous reports, our research activities were categorized in four areas: The Identification of Talent, the Training of Talented Students in Higher Educational Programs, Motivating Talented Students to Seek Advanced Training, and Methodological and Descriptive Studies. The present report follows this format, except that the second and third areas have been consolidated and a new area established: Vocational Goals. Their Origins and Development in the High School and College Years.

In the following sections, the investigations completed or in progress during the twelve-month period are summarized. The concluding sections list the staff for this period and all the studies completed during the entire period of research operation, January, 1957 through June, 1960.

I. The Identification of Talent

1. The Prediction of College Grades and Post-College Achievement (1958 Assessment). College grades (freshman year) were intercorrelated with the Sixteen Personality Factor Questionnaire, the National Merit Student Survey, the Vocational Preference Inventory, the Scholastic Aptitude Test, and High School Rank for a sample consisting of 65 per cent of a one-sixth random sample (641 boys, 311 girls) drawn from 7500 Finalists. Correlations were computed for the total male and female samples, for samples of students attending institutions with "high" and "low"

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talent supplies, for samples of students attending institutions classified as "high" and "low" in their production of graduates who go on to get the Ph.D., and for the two colleges with the largest student samples.

The results indicate that the male achiever is dependent, serious (not playful), persistent, responsible, submissive, quiet, feminine, naive, self-sufficient, and self-controlled. The female achiever is characterized as persistent, responsible, submissive, and conservative. The results for these total samples dichotomized by "high" and "low" talent supply were similar, as were the two individual college results.

The results for the total samples dichotomized by "high" and "low" Ph.D. productivity are as follows. For boys attending institutions high on the Natural Science (NS) index, high grades are associated with dedication to scholarship, dominance, super ego, and emotionality. High grades at low index institutions are associated with submissiveness, timidity or lack of adventurousness, naivete, and passivity. Several variables -- HSR, Play, Persistence, Cheerful, Self-Sufficient -- retain in both samples the relatively high correlations they had in the total sample.

Girls who get high grades at institutions high on the NS index are dependent, extraverted, intolerant of ambiguity, submissive, conventional, confident, conservative, self-controlled, and lacking in tension. High grades at low index institutions are associated with control.

There are similar differences between the samples high and low on the Arts, Humanities, and Social Sciences (AHSS) index, but the interpretation of these differences is less clear.

These findings appear to be congruent with a few of the student and faculty press characteristics associated with NS productivity (34). For example, the qualities of the male achiever in NS seem consistent with the student press for "Aggression" and "Emphasis on High Academic Standards" typical of high index institutions and the absence of these presses in low index institutions, which have

presses for "Closeness of Supervision" and "Directness of Teaching Methods" and which give good grades to students who are passive and dependent. For the female samples on the NS index and for both males and females on the AHSS index, the relation between the personality of the achiever and the institutional press is obscure and occasionally contradictory. (Completed)

2. The Achievement, Aptitudes, and Personalities of National Merit Scholars and Certificate of Merit Winners (1958). In order to estimate the effectiveness of and the biases in the selection process, the mean scores of Scholars and C of M winners on all 40 variables used in the 1958 study summarized above were compared (1). The largest differences occur on the SAT Math and Verbal factors and always favor the Scholars. Male Scholars also get significantly higher high school and college grades. The average high school and college grades of female Scholars and C of M winners are not significantly different. The differences are probably underestimated, however, since Scholars are concentrated in colleges where the competition is keener. The differences on personality variables are smaller and generally less reliable than those found for grades and aptitude. Male Scholars appear to be more introspective, shy, passive, self-controlled, serious, and intellectual than C of M winners. Female Scholars, in contrast to female C of M winners, are radical, self-sufficient, and intellectual. These tentative results suggest that the selection board has emphasized scholastic aptitude (SAT scores) and high school grades in making selections and has chosen students who resemble the stereotype of the intellectual. (Completed)

3. Creative and Academic Performance among Talented Adolescents (1959 Assessment). The information obtained in the 1959 assessment was used to study three related problems: (1) the prediction of college grades and the meaning of intellectual achievement, (2) the prediction of originality or creativity, and (3) the exploration of a theory of vocational choice. About 83 per cent of the one-sixth random sample of the Finalists in the 1959 program who were tested and polled returned completed materials. The data consisted of 75 variables, including self and

teacher ratings, originality measures, the student's vocational interests and aspirations, and information about his background. The student's mother filled out the Parental Attitude Research Inventory (PARI), and his father ranked nine values and traits in the order which he considered them valuable for his son to possess.

The first study, "Creative and Academic Performance among Talented Adolescents" (4), tested a number of hypotheses about the nature of the academic achiever and the creative performer at the high school level. High school grades (HSR) were used as a criterion of academic performance, and two checklists were constructed to estimate scientific and artistic creativity at the high school level. Creative performance is defined as a performance which is accorded public recognition through awards, prizes, or publications, and which may therefore be assumed to have cultural value. Typical items in these checklists are: winning science talent search awards, having scientific papers published, presenting papers at meetings of professional societies, and winning awards in art, creative writing, or speech contests.

All 75 variables were intercorrelated. The correlations between the three criteria of academic and creative performance and the 72 predictors were then corrected for the effect of SAT-Math. These corrections were small; the largest difference between uncorrected and partial r's was only .05.

For boys, a review of the correlations at the 1 per cent level reveals that the three kinds of performance (scientific, artistic, and academic) are associated with somewhat different variables, generally in expected directions. The boy with a high score on the Creative Science Scale has many artistic achievements and creative activities, plans to get an advanced degree, is a first-born or an only child, and has high scores on the Independence of Judgment, Mastery, Deferred Gratification, Initiative, Physical Activity, and Intellectuality scales and low scores on the Responsibility and Status scales. He rates himself high on originality, independence, and perseverance. Fathers of boys high on scientific performance regard curiosity as a valuable trait for their sons to have; mothers of these boys tend to

be agreeable (supposedly comfortable in their role as mothers) rather than irritable.

High scores on the artistic performance checklist are positively correlated with seeking an advanced degree, and with having high scores on the Creative Activities, Esthetic Sensitivity, Sense of Destiny, Differential Reaction Schedule (total score), Breadth of Interest, Self-Evaluation, Self-Assurance, Occupational Level, Acquiescence (Response Bias), Responsibility, Verbal Activity, Emotionality, Control, and Status Scales; they are negatively correlated with high self ratings of Originality, Drive to Achieve, Independence, Self-Confidence, and Perseverance. Mothers of students who evidence artistic creativity are slightly more accepting of the homemaking role than are mothers of students with few artistic performances.

The variables related to academic performance are somewhat different from those related to creative performance. Academic performance (HSR) is negatively correlated with high scores on the Complexity-Simplicity, Independence of Judgment, and Barron Originality scales and positively correlated with high scores on the Mastery, Deferred Gratification, Self-Evaluation, Self-Assurance, Control, and Status scales. Boys who get good grades rate themselves high on Popularity, Drive to Achieve, Self-Confidence, and Perseverance, and their teachers rate them high on Citizenship, Popularity, and Social Leadership. Fathers of these students want their sons to become good students and are less concerned with their being independent and self-reliant. Mothers of these boys tend to be authoritarian (at the 1 per cent level, Avoidance of Communication; and at the 5 per cent level, Seclusion of Mother, Martyrdom, Suppression of Aggression, and Acceleration of Development).

The findings for girls were similar to those for boys.

The students' free responses to the question, "What do you daydream about when you think of your future occupation?" were coded and related to the three criteria of academic and creative performance. These results are compatible with the results of the correlational analysis. Students with many creative accomplishments

daydream more about future high achievement than do students with fewer accomplishments. Students with high grades do not daydream about future achievement any more than do students with slightly lower grades.

In another analysis, we found that only 5 to 24 per cent of the students falling in the top 20 per cent on SAT-V or M also fall in the most creative group (top 16 to 18 per cent). These results indicate that aptitude and creative accomplishment are unrelated in samples of students with unusually high scholastic aptitude.

Finally, two centroid factor analyses of 70 of the 75 variables were performed for samples of boys and girls. Twenty-three factors were obtained for each sample and 12 factors were rotated to simple structure. Ten of the 12 rotated factors appear to be common to both factor analyses. This analysis helps to reduce the number of variables which will be used in future studies and provides a large number of hypotheses about the nature of academic and creative performance.

With these data, we hope to study the relation between the student's performance and his parents' attitudes and values and to compare the achievement of the student whose parents have similar values with the achievement of the student whose parents differ from one another in their values. Scientific, artistic, and academic performance will all be used as criteria in these analyses; that is, separate analyses will be done for students who are high on all three criteria, low on all three, high on one and low on two, etc. The 75 variables used in the present study will also be related to the student's grades in his freshman year in college; see Technical Report No. 3 and the follow-up study of creative performance described on page 8 of this report. (Completed)

4. A Comparison of National Merit Scholars and Certificate of Merit Winners (1959 Assessment). The data in the 1959 assessment was also used to compare Scholars and C of M winners, following the method used in the 1958 study (3). The results of this analysis are generally consistent with the 1958 study; they indicate that the chief variables which distinguish these groups are aptitude scores (SAT-V and M, NMSQT, Science and Humanities composites) and high school grades.

The fact that none of the 13 originality variables differentiate the Scholars from the C of M winners suggests that we need to construct new variables which will help us to select students who are capable of creative behavior as well as academic achievement. With this end in mind, several promising preliminary checklists and scales from the 1959 assessment will be tried out in the next selection program. (Completed)

5. The Prediction of College Grades, Creativity, and Post-College Achievement (1960 Assessment). In the assessment study for 1960, we continued to explore variables thought to be related to academic achievement and to creative behavior in the college and post-college years. This particular assessment combined the most efficient predictors from the 1956-59 assessments with a few new variables. In May, 1960, a one-seventh random sample (N=1419) of Finalists was administered the following scales and inventories: the Femininity, Socialization, and Social Presence Scales of the California Psychological Inventory; the Persistence, Super Ego, Deferred Gratification, and Mastery Scales of the National Merit Student Survey (1958, 1959); the Dominance, Super Ego Strength, and Radicalism Scales of the Sixteen Personality Factor Questionnaire; the Myers-Briggs Type Indicator; and the Preconscious Activity, Dogmatism (Rokeach), Acquiescence (Couch), Intolerance for Ambiguity (Budner), Complexity-Simplicity (Barron), Risk-Taking (Torrance), and Sense of Destiny (Gough) Scales. Students also answered some free response and structured items about their academic and vocational goals. A set of 20 self-ratings and a Breadth of Interest (47 activities) score was obtained for each student.

Both parents of each student were polled and tested with selected PARI scales (Fostering Dependency, Seclusion of the Mother, Martyrdom, Excluding Outside Influences, Suppression of Aggression, Approval of Activity, Avoidance of Communication, Suppression of Sex, Ascendency of the Mother, Intrusiveness, and Acceleration of Development). A Parental Guidance Scale (PGS) was developed to measure some of the same attitudes assessed by the PARI, except that the PGS was devised

for parents with adolescent rather than small children (the content of the PARI is concerned primarily with babies and small children). We expect the PARI and PGS to be highly intercorrelated. Budner's Intolerance for Ambiguity Scale was given to both parents; and they were asked what their vocational preferences were, and what values and personal traits they wanted their child to have. Finally, they were asked to rate their child for 20 traits on a five-step scale and to give their direct opinions about what influences in his life contributed to his unusual achievement. These replies will be scored for their content and for the values they appear to represent. (In progress)

6. Longitudinal Studies of the 1956, 1957, 1958, and 1959 Finalist Samples. In order to study creative performance in college, Finalists in all previous pre-college assessments (1956-59) were asked to fill out a checklist assumed to measure creative performance (the artistic and scientific creative performance scales used in the 1959 assessment were revised to cover collegiate achievement and a new scale -- Social and Business Leadership -- was added). These criteria, along with college grades, will make possible 4 longitudinal studies at 1-, 2-, 3-, and 4-year intervals. (In progress)

7. The Meaning of High School Achievement. This study, initiated in 1959, was abandoned since the study of high school achievement has been incorporated in other studies (2, 4).

II. The Training and Motivation of Talented Students in Higher Educational Programs

Changes in the study plans of gifted students are important because of their possible consequences for the supply of talent in different fields. The following studies are aimed at learning more about the various incentives and activities, intellectual and social, which influence talented students to enter different fields of concentration and graduate or professional training.

Two developments during the year have influenced the scope and direction of these studies. First, Dr. Thistlethwaite, whose efforts have been devoted to this

area, has assumed direction of a cooperative research project involving NMSC, Northwestern University, and the U. S. Office of Education. Only 20 per cent of his time has been and will be devoted to the present series of studies. Second, a comparison of the results achieved through ex post facto designs (the use of matched groups) and those achieved through a newly-developed mode of analysis, called regression-discontinuity analysis, has demonstrated that the former may lead to erroneous inferences concerning the effects of awarding recognition, scholarships, etc. As a consequence, all ex post facto studies in progress have been modified or discontinued.

The following studies deal successively with the effects of social recognition in high school, of faculty and student pressures in college, and of fellowship offers at the end of college upon the student's study plans.

1. Effects of Social Recognition upon Finalists in the National Merit Program (1958 Certificate of Merit Winners). A final report of this study, which describes the student's retrospective evaluation of the effects of winning the Certificate of Merit and presents a theory of the effects of social recognition, was completed and accepted for publication (7, 42). (Completed)

2. A Regression-Discontinuity Analysis of the Effects of Social Recognition. In collaboration with Dr. Donald T. Campbell at Northwestern University, a new method of testing casual hypotheses in quasi-experimental settings was developed. A paper which compares the results obtained by this new mode of analysis with those obtained by an ex post facto design applied to the same data has been completed and submitted for publication (9). Both analyses indicate that the C of M award increases the likelihood that the recipient will receive a scholarship from other donors. The new analysis provides no clear-cut evidence that recognition affects the student's career plans, although an effect upon plans to seek graduate or professional degrees is not ruled out. The previous report about effects upon attitudes toward intellectualism (41) was clearly contradicted by the new analysis. If we regard the new mode of analysis as the more definitive, it appears that, for six

dependent variables, the previous ex post facto experiment underestimated effects for one variable and wrongly indicated effects for three others. It may be concluded that while the ex post facto design has some value in probing or testing a theory, it is less trustworthy than the new mode of analysis. Unfortunately, regression-discontinuity analysis is applicable only when the regression of dependent variables on a single determiner of exposure to an experimental variable can be plotted. Practically, this means that though the problem of evaluating the effects of recognition awards in the present program has been solved, an adequate quasi-experimental method of assessing the effects of scholarships has yet to be developed. Efforts to solve the latter problem are continuing on the related Office of Education project.

3. Effects of Scholarships upon Achievement in College. (Discontinued)

4. Revision of Scales for Assessing Faculty and Student Press. We have completed a second revision of rating scales for assessing the characteristics of different colleges and major fields of concentration, which earlier research suggested were related to change in motivation to seek advanced training. As a result of the study described in the next section, new items were written for 18 scales and two new scales were added. The 20 revised scales, each consisting of 10 statements to which students are asked to give True or False responses, are as follows (Kuder-Richardson Formula 20 reliabilities are shown in parentheses for earlier versions where available):

Faculty Press Scales		Student Press Scales	
Achievement	(.73)	Achievement	(.74)
Affiliation	(.70)	Aestheticism	(.78)
Compliance	(.57)	Aggression	(.59)
Directiveness	(.50)	Breadth of Interest	(.57)
Enthusiasm	(.77)	Competition	(.77)
Humanism	(.75)	Openness to Faculty Influence	
Independence	(.60)	Participation	(.57)
Scientism		Reflectiveness	(.76)
Supportiveness	(.44)	Scientism	(.76)
Vocationalism	(.69)	Social Conformity	(.62)

Studies of the validity of these measures of the college environment are discussed in the following sections. (Completed)

5. Effects of Social Interactions in College upon the Study Plans of Talented Students. The analysis of data and preparation of a manuscript, which has been accepted for publication (8), were completed. Papers were also completed for presentation this fall at the annual meetings of the American Sociological Association and the American Psychological Association.

First, striking congruences were found between (a) the institutional characteristics previously found to be associated with the production of Bachelor graduates who later earn Ph.D's in the sciences and humanities (34, 35), and (b) the faculty characteristics associated with changes in the plans of 1500 Merit Scholars and C of M winners in the first Merit Program to seek graduate or professional training. The following relationships have thus been confirmed in two independent studies: high scores on the faculty press scales for Affiliation, Enthusiasm, Achievement, Humanism, or Independence are associated with increased motivation to seek advanced degrees in the arts, humanities, and social sciences; low scores on the faculty press scales for Compliance are associated with increased motivation to seek advanced training in the natural and biological sciences. In general, students in the natural and biological sciences make their plans to seek graduate or professional training earlier than do students in other fields; moreover, these changes in plans are less frequently related to the measured college characteristics.

Second, students' reports of the demands and pressures of the faculty in their major field and of students in their classrooms and living groups indicate that there are marked differences between fields. Sixteen of the 18 press scales used in this study significantly differentiated between fields. For example, faculties in the natural sciences were characterized by a strong press for vocationalism, achievement, and compliance, while those in the arts and humanities were seen by the student as enthusiastic, affiliative and supportive, and exercising a strong press for humanism and independence. Science faculties also appear to be more frequently characterized by the use of pedagogical techniques which encourage the student to play the role of a novice rather than of a potential scholar or scientific investigator. Stimulating teachers in the natural and biological sciences

are more frequently remembered as discussing correct answers to tests, and less often remembered as being critical of the ideas and work of colleagues or as stressing the development of the student's critical abilities. Such differences between fields may in part explain the observed drift of Merit Finalists out of the natural and biological sciences. During the first years of college, the social sciences recruited 3.12 boys for each boy who withdrew, while the natural sciences recruited only one male student for every three who withdrew. Girls exhibited a similar drift out of the sciences.

A follow-up study is being made to determine which students actually enter graduate or professional school. A report on the last phase of this study will be completed during the next report period. (In progress)

6. Recruitment of Talented Students in Different Fields of Specialization. Although the broad classification of fields used in the preceding study appears to have been effective in identifying some of the departmental "atmospheres" associated with changes in study plans, our analyses suggest that there are important differences between even such closely related disciplines as engineering and mathematics. Unfortunately the number of students was too small to permit breakdowns by specific departments. The present study is similar in design to the preceding one, except that only Merit Scholars and C of M winners who indicated they intended to major in one of 14 major fields were surveyed. The fields having a sufficient number of students to be included were classified as follows:

Natural sciences: Chemistry, Engineering, Mathematics, Physics
Biological sciences: Biology
Social sciences: Education, History, Political Science, Psychology, Sociology
Arts and Humanities: English, Languages, Philosophy
Other fields: Business

Approximately 1400 of the students winning awards in the 1958 Merit program were surveyed in June, 1960. Changes in the direction and level of their career aspirations during the first two years of college will be related to faculty and

student press scores on the 20 press scales described above and to participation in Honors and Advanced Placement programs in their colleges. (In progress)

7. Institutional Characteristics and College Productivity. This study is aimed at providing a cross-validation of the college press scales used to identify institutions which are productive of Bachelor degree graduates who later attain the Ph.D. degree. All Finalists in the 1958 Merit program who enrolled in one of 33 selected colleges for which productivity indexes are available (34, 35) were surveyed in June, 1960. Since these 33 colleges are a different group than the 36 colleges in the earlier study, the results will provide cross-validation data for evaluating the trustworthiness of the faculty and student press scales used in identifying environments conducive to intellectual achievement. (In progress)

8. Fellowships as Factors in Graduate School Recruitment. Previously reported plans to compare winners and nonwinners of fellowships in an ex post facto experiment have been modified. An attempt will be made, probably by the use of partial correlation techniques, to study the effects of fellowship opportunities upon enrollment in graduate school. A survey in June, 1960 of the 1500 Merit Finalists in the 1956 program described above will provide information on the sources and amounts of fellowship aid received by these students. (In progress)

III. Vocational Goals: Their Origins and Development in the High School and College Years

This group of studies is intended, first, to discover the ways in which talented students select vocational goals, the personal and impersonal origins of these choices, and the collegiate experiences which affect the student's goals; and secondly, to develop a theory of vocational goals which will integrate this knowledge. Post-college studies concerned with vocational achievement will be integrated with the identification studies.

The studies so far completed stem largely from two previous reports: the rationale of an inventory of occupational titles developed to measure personality (14) and a theory of vocational choice (16). The ideas in these preliminary reports

have led to a series of studies about vocational preference, choice of occupation and major field, the relation of the student's vocational goals to his aptitudes, personality, potential for creativity, self-evaluation, his parent's values and attitudes, etc. (18, 22).

1. Some Explorations of a Theory of Vocational Choice and Achievement (1959). The data from the 1958 assessment was used to explore some hypotheses derived from a theory of vocational choice. In order to learn the attributes of the six hypothetical classes of persons (vocational classes) the student's membership in a given class was related to his scores on personality variables, self and teacher ratings, background, and his responses to a number of questions about his vocational choice, such as his daydreams about his future occupation and the major influences on his choice. Chi square and correlational analyses (the relation of student attributes to class membership) were performed to test the validity of the hypothetical class descriptions and to provide more complete information for reformulating these descriptions. The results of this study and a review of related research led to a renaming of the classes. They are now called the Realistic, Intellectual, Social, Conventional, Enterprising, and Artistic classes. The hypothesis that the level of occupational choice is a function of self-evaluation and intelligence was also tested. A 40-page report of the study was completed in this period. The data analysis for a similar report based on the 1959 assessment is almost completed and will be integrated with the earlier report.

Generally, the results are significant and encouraging. An unexpected finding is that each occupational class, or personality type, seems to have a characteristic kind of achievement as well as typical vocational choice. Creative performance appears to be associated most frequently with the Intellectual and Artistic classes; leadership (as demonstrated by election to school offices) is associated with the Social and Enterprising classes; academic achievement is associated primarily with the Intellectual, Social, and Conventional classes. An item analysis of individual creative achievements also supports these results. These

results suggest that vocational choice should be regarded as one sign of the "direction of behavior" and level of vocational choice as one outcome of a complex, "motivation to achieve." (Completed)

2. Further Explorations of a Theory of Behavior and Achievement (1960). The most promising ideas from the earlier studies of vocational choice and achievement have been included in the 1960 assessment. (See the section on The Identification of Talent for a list of variables.) In the 1960 study, we incorporated a comprehensive set of scales and ratings and a group of old and new questionnaire items planned to test a number of hypotheses about vocational choice and achievement. The student and both his parents will be studied with this material. (In progress)

3. A Theory of Behavior and Achievement (1960). In the year to come, we hope to write a preliminary theory of achievement which will serve to integrate our knowledge of this field and to suggest new research.

IV. Methodological and Descriptive Studies

Our chief emphasis is on studies central to the main objectives of the Corporation and the research program--for instance, the identification of talent, stimulating college environments, and talent loss. But whenever practicable, we will continue to study various special problems. Such studies provide status reports about talented youth and make use of available data relevant to problems of general scientific and educational interest.

1. A Descriptive Study of Talented Adolescents. All scales and inventories with suitable reference groups or norms used in the 1957-1960 Assessments are being processed to provide a comprehensive descriptive study of talented students. (In progress)

2. The Concentration of Scholarship Funds and Its Implications for Education. This report attempted to outline some of the consequences of the concentration of scholarship funds in a limited number of colleges and scholarship agencies. Some suggestions for the selection of students and research in student selection were presented. (Completed)

Research Staff

The following persons were employed on the research staff during the period covered in this report:

Name	Title	Period of Employment	% of Time
John L. Holland	Director of Research	7- 1-59 - 6-30-60	100
Donald L. Thistlethwaite	Associate Director of Research	7- 1-59 - 6-30-60	100
Rex L. Hanks, Jr.	Research Assistant	7- 1-59 - 4-30-60	100
Laura P. Kent	Research Assistant	7- 1-59 - 6-30-60	60
Elizabeth K. van Laer	Research Assistant	9-16-59 - 6-15-60	50
David Krantz	Research Assistant	7- 1-59 - 10-31-59	70
F. Suzanne Brua	Secretary	7- 1-59 - 6-30-60	100
Virginia O. Chalmers	Secretary	7- 1-59 - 6-30-60	100

References for Papers Completed during the period July 1, 1959 through June 30, 1960

1. Holland, J. L. The achievement, aptitudes, and personalities of National Merit Scholars and Certificate of Merit winners. The Bulletin of the National Association of Secondary School Principals, 1960, 44, 100-104.

2. ------. The prediction of college grades from personality and aptitude variables. Unpublished manuscript.*

3. ------. A comparison of National Merit Scholars and Certificate of Merit winners. The Bulletin of the National Association of Secondary School Principals, in press.*

4. ------. Creative and academic performance among talented adolescents. Unpublished manuscript.*

5. ------. Some explorations of a theory of vocational choice and achievement. Unpublished manuscript.*

6. ------ & Kent, Laura. The concentration of scholarship funds and its implications for education. College and University, in press.*

7. Thistlethwaite, D. L. The recognition of excellence. College and University, in press.*

8. ------. College press and changes in the study plans of talented students. J. educ. Psychol., in press.*

9. ------ & Campbell, D. T. Regression-discontinuity analysis--an alternative to the ex post facto experiment. Unpublished manuscript.*

* Reports or reprints not available.

References for Reports Completed during the period

January 1, 1957 through June 30, 1959

10. Holland, J. L. Undergraduate origins of American scientists. Science, 1957, 126, 433-437.

11. ------. Student explanations of college choice and their relation to college popularity, college productivity, and sex differences. College and University, 1958, 33, 313-320.*

12. ------. A note on the reliability and validity of the Minnesota Scale for Paternal Occupations as an estimate of family economic status. J. appl. Psychol., 1958, 42, 195-196.*

13. ------. The prediction of scholastic success from a high aptitude sample. School and Society, 1958, 86, 290-293.*

14. ------. A personality inventory employing occupational titles. J. appl. Psychol., 1958, 42, 336-342.*

15. ------. Parental expectations and attitudes about colleges. College and University, 1959, 34, 164-170.

16. ------. A theory of vocational choice. J. counsel. Psychol., 1959, 6, 35-45.*

17. ------. Determinants of college choice. College and University, 1959, 35, 11-28.

18. ------. A classification for occupations in terms of personality and intelligence. Amer. Psychologist, 1959, 14, 376. (Abstract)*

19. ------. The undergraduate achievement of National Merit Scholars and Certificate of Merit winners. The Bulletin of the National Association of Secondary School Principals, 1959, 43, 190-192.

20. ------. Some limitations of teacher ratings as predictors of creativity. J. educ. Psychol., 1959, 50, 219-223.

21. ------. The prediction of college grades from the California Psychological Inventory and Scholastic Aptitude Test. J. educ. Psychol., 1959, 50, 135-142.

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